

Marble Ramp Lab

28 Points Total

The goal of this lab is to relate the displacement in the x-direction to the angle of launch of a marble. Changing the angle of launch will change the initial velocity of the marble, and therefore affect the displacement in the x-direction.

Instructions:

1. Place a meter stick on the floor beneath the lab table to record displacement in the x-direction.
2. Place the paper ramp on the table at the appropriate angle and the marble at the top of the ramp, and release the marble.
3. Record the time of flight, x-displacement, y-displacement, and angle that the ramp makes with the table.
4. Angles to measure: 10° , 20° , 30° , 40° , 50° , 60° , 70° , 80° . For each angle, take three trials.
5. For each angle, calculate the initial velocity.
6. See the rubric below for further questions.

Rubric:

1. Procedure (3 points). Write a short summary of the steps you took to perform the experiment.
2. Data table (4 points). Must be complete and neat.
3. Calculations (4 points). For each angle, calculate the initial velocity. Show full work for first calculation, then you may simply plug in the other data.
4. Graphs (6 points; 2 each). Three separate graphs (y-axis v. x-axis): Δx v. t , velocity v. t , and angle v. Δx .
5. How do Δx and the angle relate to each other? (2 points)
6. What does changing the angle affect? (2 points)
7. Name two specific sources of error (2 points) and one way for each that you could minimize the error (2 points).
8. Summary sentence(s) of the experiment (3 points). Write a short summary of the experiment, which includes what you were looking for, what you did, and your result.